CLAIMS

1. A method of forming a film of a diamond electrode, said method comprising:

performing a CVD process by supplying a mixed gas comprising a carbon source and hydrogen to form a diamond film on a substrate,

wherein performing said CVD process comprises forming, as an outermost surface of the diamond film, a high-quality diamond film having substantially no impurities.

2. The method according to claim 1, wherein said CVD process comprises:

a first process of supplying the mixed gas containing a high-concentration carbon source to form a low-quality thick first diamond film on the substrate at a high film-formation rate; and

a second process of supplying the mixed gas containing a low-concentration carbon source to form a high-quality thin second diamond film on the first diamond film at a low film-formation rate.

3. The method according to claim 2, wherein:

said CVD process comprises one of a hot filament CVD process and a microwave plasma CVD process;

methane is used as the carbon source;

a concentration of the methane used in said first process is in a range of 1 to 10 %; and

a concentration of the methane used in said second process is not more than 1 %, preferably not more than 0.3 %.

4. The method according to claim 2, wherein:

the first diamond film is formed so as to have a thickness of not less than 1 μm,

preferably not less than 10 μm; and

the second diamond film is formed so as to have a thickness of not more than 1 μm.

5. The method according to claim 2, wherein graphite is used as material of the substrate.